3GPP TSG-RAN WG3 Meeting #127bis R3-25xxxx

**Wuhan, China, 7th – 11th April, 2025**

**Agenda item:** 21.3

**Source:** Lenovo

**Title:** (TP to XR BL CR for 38.413) Support of UL Bit Rate Control

**Document for:** Discussion and Approval

# Introduction

This paper provides the text proposal to TS 38.413 regarding UL bit rate control.

# Text Proposal

**--------------------------------------------------------------------1st Change-----------------------------------------------------**

9.3.1.12 QoS Flow Level QoS Parameters

This IE defines the QoS parameters to be applied to a QoS flow.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| CHOICE *QoS Characteristics* | M |  |  |  | - |  |
| *>Non-dynamic 5QI* |  |  |  |  |  |  |
| >>Non Dynamic 5QI Descriptor | M |  | 9.3.1.28 |  | - |  |
| *>Dynamic 5QI* |  |  |  |  |  |  |
| >>Dynamic 5QI Descriptor | M |  | 9.3.1.18 |  | - |  |
| Allocation and Retention Priority | M |  | 9.3.1.19 |  | - |  |
| GBR QoS Flow Information | O |  | 9.3.1.10 | This IE shall be present for GBR QoS flows and is ignored otherwise. | - |  |
| Reflective QoS Attribute | O |  | ENUMERATED (subject to, …) | Details in TS 23.501 [9]. This IE may be present in case of Non-GBR QoS flows and is ignored otherwise. | - |  |
| Additional QoS Flow Information | O |  | ENUMERATED (more likely, …) | This IE indicates that traffic for this QoS flow is likely to appear more often than traffic for other flows established for the PDU session.  This IE may be present in case of Non-GBR QoS flows and is ignored otherwise. | - |  |
| QoS Monitoring Request | O |  | ENUMERATED (UL, DL, Both, …, stop) | Indicates to measure UL, or DL, or both UL/DL delays for the associated QoS flow or stop the corresponding QoS monitoring. | YES | ignore |
| QoS Monitoring Reporting Frequency | O |  | INTEGER (1.. 1800, …) | Indicates the reporting frequency for RAN part delay for QoS monitoring.  Units: second | YES | ignore |
| **PDU Set QoS Parameters** |  | *0..1* |  |  | YES | ignore |
| >UL PDU Set QoS Information | O |  | PDU Set QoS Information  9.3.1.264 |  | - |  |
| >DL PDU Set QoS Information | O |  | PDU Set QoS Information  9.3.1.264 |  | - |  |
| UL Bit Rate Control | O |  | ENUMERATED (subject to, …) | Indicates to whether the QoS flow is subject to UL bit rate control as specified in TS 38.300 [8] | YES | ignore |

**--------------------------------------------------------------------2nd Change-----------------------------------------------------**

### 9.4.5 Information Element Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

NGAP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

id-AdditionalDLForwardingUPTNLInformation,

id-AdditionalULForwardingUPTNLInformation,

id-AdditionalDLQosFlowPerTNLInformation,

id-AdditionalDLUPTNLInformationForHOList,

id-AdditionalNGU-UP-TNLInformation,

id-AdditionalRedundantDL-NGU-UP-TNLInformation,

id-AdditionalRedundantDLQosFlowPerTNLInformation,

id-AdditionalRedundantNGU-UP-TNLInformation,

id-AdditionalRedundantUL-NGU-UP-TNLInformation,

id-AdditionalUL-NGU-UP-TNLInformation,

id-AlternativeQoSParaSetList,

id-AssistanceInformationQoE-Meas,

id-AdditionalCancelledlocationReportingReferenceIDList,

id-BurstArrivalTimeDownlink,

id-Cause,

id-CNPacketDelayBudgetDL,

id-CNPacketDelayBudgetUL,

id-CNTypeRestrictionsForEquivalent,

id-CNTypeRestrictionsForServing,

id-CommonNetworkInstance,

id-ConfiguredTACIndication,

id-CN-MT-CommunicationHandling,

id-CurrentQoSParaSetIndex,

id-DAPSRequestInfo,

id-DAPSResponseInfoList,

id-DataForwardingNotPossible,

id-DataForwardingResponseERABList,

id-DirectForwardingPathAvailability,

id-DL-NGU-UP-TNLInformation,

id-DownlinkTLContainer,

id-EndpointIPAddressAndPort,

id-EnergySavingIndication,

id-ExtendedMobilityInformation,

id-ExtendedPacketDelayBudget,

id-ExtendedRATRestrictionInformation,

id-ExtendedReportIntervalMDT,

id-ExtendedSliceSupportList,

id-ExtendedTAISliceSupportList,

id-ExtendedUEIdentityIndexValue,

id-EUTRA-PagingeDRXInformation,

id-EquivalentSNPNsList,

id-GlobalCable-ID,

id-GlobalRANNodeID,

id-GlobalTNGF-ID,

id-GlobalTWIF-ID,

id-GlobalW-AGF-ID,

id-GUAMIType,

id-HashedUEIdentityIndexValue,

id-IncludeBeamMeasurementsIndication,

id-IntersystemSONInformationRequest,

id-IntersystemSONInformationReply,

id-IntersystemResourceStatusUpdate,

id-IntersystemMobilityFailureforVoiceFallback,

id-LastEUTRAN-PLMNIdentity,

id-LastVisitedPSCellList,

id-LocationReportingAdditionalInfo,

id-M4ReportAmount,

id-M5ReportAmount,

id-M6ReportAmount,

id-ExcessPacketDelayThresholdConfiguration,

id-M7ReportAmount,

id-MaximumIntegrityProtectedDataRate-DL,

id-MBS-AreaSessionID,

id-MBS-QoSFlowsToBeSetupList,

id-MBS-QoSFlowsToBeSetupModList,

id-MBS-QoSFlowToReleaseList,

id-MBS-ServiceArea,

id-MBS-SessionFSAIDList,

id-MBS-SessionID,

id-MBS-ActiveSessionInformation-SourcetoTargetList,

id-MBS-ActiveSessionInformation-TargettoSourceList,

id-MBS-AssistanceInformation,

id-MBS-SessionTNLInfo5GC,

id-MBS-SupportIndicator,

id-MBSSessionFailedtoSetupList,

id-MBSSessionFailedtoSetuporModifyList,

id-MBSSessionSetupResponseList,

id-MBSSessionSetuporModifyResponseList,

id-MBSSessionToReleaseList,

id-MBSSessionSetupRequestList,

id-MBSSessionSetuporModifyRequestList,

id-MDTConfiguration,

id-MicoAllPLMN,

id-NetworkInstance,

id-NGAPIESupportInformationRequestList,

id-NGAPIESupportInformationResponseList,

id-NID,

id-NR-CGI,

id-NRNTNTAIInformation,

id-NPN-MobilityInformation,

id-NPN-PagingAssistanceInformation,

id-NPN-Support,

id-NR-PagingeDRXInformation,

id-OldAssociatedQosFlowList-ULendmarkerexpected,

id-OnboardingSupport,

id-PagingAssisDataforCEcapabUE,

id-PagingCauseIndicationForVoiceService,

id-PDUSessionAggregateMaximumBitRate,

id-PduSessionExpectedUEActivityBehaviour,

id-PDUSessionPairID,

id-PDUSessionResourceFailedToSetupListCxtFail,

id-PDUSessionResourceReleaseResponseTransfer,

id-PDUSessionType,

id-PEIPSassistanceInformation,

id-PSCellInformation,

id-PNI-NPNBasedMDT,

id-PNI-NPN-AreaScopeofMDT,

id-QMCConfigInfo,

id-QosFlowAdditionalInfoList,

id-QosFlowAddOrModifyRequestList,

id-QosFlowFailedToSetupList,

id-QosFlowFeedbackList,

id-QosFlowParametersList,

id-QosFlowSetupRequestList,

id-QosFlowToReleaseList,

id-QosMonitoringRequest,

id-QosMonitoringReportingFrequency,

id-SNPN-CellBasedMDT,

id-SNPN-TAIBasedMDT,

id-SNPN-BasedMDT,

id-SuccessfulHandoverReportList,

id-SupportedUETypeList,

id-UEContextReferenceAtSource,

id-RAT-Information,

id-RedundantCommonNetworkInstance,

id-RedundantDL-NGU-TNLInformationReused,

id-RedundantDL-NGU-UP-TNLInformation,

id-RedundantDLQosFlowPerTNLInformation,

id-RedundantPDUSessionInformation,

id-RedundantQosFlowIndicator,

id-RedundantUL-NGU-UP-TNLInformation,

id-SCTP-TLAs,

id-SecondaryRATUsageInformation,

id-SecurityIndication,

id-SecurityResult,

id-SgNB-UE-X2AP-ID,

id-S-NSSAI,

id-SONInformationReport,

id-SourceNodeID,

id-SourceNodeTNLAddrInfo,

id-SourceSN-to-TargetSN-QMCInfo,

id-SourceTNLAddrInfo,

id-SurvivalTime,

id-Selected-Target-SNPN-Identity,

id-TNLAssociationTransportLayerAddressNGRAN,

id-TAINSAGSupportList,

id-TargetHomeENB-ID,

id-TargetRNC-ID,

id-TimeBasedHandoverInformation,

id-TraceCollectionEntityURI,

id-TSCTrafficCharacteristics,

id-UEHistoryInformationFromTheUE,

id-UERadioCapabilityForPaging,

id-UERadioCapabilityForPagingOfNB-IoT,

id-UL-NGU-UP-TNLInformation,

id-UL-NGU-UP-TNLModifyList,

id-ULForwarding,

id-ULForwardingUP-TNLInformation,

id-UplinkTLContainer,

id-UsedRSNInformation,

id-UserLocationInformationTNGF,

id-UserLocationInformationTWIF,

id-UserLocationInformationW-AGF,

id-UserPlaneErrorIndicator,

id-EarlyMeasurement,

id-BeamMeasurementsReportConfiguration,

id-DLDiscarding,

id-TAI,

id-HFCNode-ID-new,

id-GlobalCable-ID-new,

id-FiveGProSeLayer2Multipath,

id-CandidateRelayUEInformationList,

id-FiveGProSeLayer2UEtoUERelay,

id-FiveGProSeLayer2UEtoUERemote,

id-SuccessfulPSCellChangeReportList,

id-TargetCellCRNTI,

id-TimeSinceFailure,

id-ClockQualityReportingControlInfo,

id-RANfeedbacktype,

id-QoSFlowTSCList,

id-TSCTrafficCharacteristicsFeedback,

id-ANPacketDelayBudgetUL,

id-MBSCommServiceType,

id-MobileIAB-MTUserLocationInformation,

id-PDUsetQoSParameters,

id-PDUSetbasedHandlingIndicator,

id-N6JitterInformation,

id-ECNMarkingorCongestionInformationReportingRequest,

id-ECNMarkingorCongestionInformationReportingStatus,

id-MN-only-MDT-collection,

id-XrDeviceWith2Rx,

id-MaximumDataBurstVolume,

id-MBS-NGUFailureIndication,

id-UserPlaneFailureIndication,

id-UserPlaneFailureIndicationReport,

id-QoERVQoEReportingPaths,

id-UserLocationInformationN3IWF-without-PortNumber,

id—ULBitRateControl,

maxnoofAllowedAreas,

maxnoofAllowedCAGsperPLMN,

maxnoofAllowedS-NSSAIs,

maxnoofAoIMinusOne,

maxnoofBluetoothName,

maxnoofBPLMNs,

maxnoofCAGforMDT,

maxnoofCAGSperCell,

maxnoofCandidateCells,

maxnoofCellIDforMDT,

maxnoofCellIDforQMC,

maxnoofCellIDforWarning,

maxnoofCellinAoI,

maxnoofCellinEAI,

maxnoofCellsforMBS,

maxnoofCellsingNB,

maxnoofCellsinngeNB,

maxnoofCellsinNGRANNode,

maxnoofCellinTAI,

maxnoofCellsinUEHistoryInfo,

maxnoofCellsUEMovingTrajectory,

maxnoofDRBs,

maxnoofEmergencyAreaID,

maxnoofEAIforRestart,

maxnoofEPLMNs,

maxnoofEPLMNsPlusOne,

maxnoofE-RABs,

maxnoofErrors,

maxnoofExtSliceItems,

maxnoofESNPNs,

maxnoofForbTACs,

maxnoofFreqforMDT,

maxnoofMBSFSAs,

maxnoofMBSQoSFlows,

maxnoofMBSServiceAreaInformation,

maxnoofMBSAreaSessionIDs,

maxnoofMBSSessions,

maxnoofMBSSessionsofUE,

maxnoofMDTPLMNs,

maxnoofMRBs,

maxnoofMultiConnectivity,

maxnoofMultiConnectivityMinusOne,

maxnoofNeighPCIforMDT,

maxnoofNGAPIESupportInfo,

maxnoofNGConnectionsToReset,

maxNRARFCN,

maxnoofNRCellBands,

maxnoofNSAGs,

maxnoofPagingAreas,

maxnoofPC5QoSFlows,

maxnoofPDUSessions,

maxnoofPLMNs,

maxnoofPLMNforQMC,

maxnoofQosFlows,

maxnoofQosParaSets,

maxnoofRANNodeinAoI,

maxnoofRecommendedCells,

maxnoofRecommendedRANNodes,

maxnoofAoI,

maxnoofPSCellsPerPrimaryCellinUEHistoryInfo,

maxnoofReportedCells,

maxnoofSensorName,

maxnoofServedGUAMIs,

maxnoofSliceItems,

maxnoofMDTSNPNs,

maxnoofSNSSAIforQMC,

maxnoofSuccessfulHOReports,

maxnoofTACs,

maxnoofTACsinNTN,

maxnoofTAforMDT,

maxnoofTAforQMC,

maxnoofTAIforInactive,

maxnoofTAIforMBS,

maxnoofTAIforPaging,

maxnoofTAIforRestart,

maxnoofTAIforWarning,

maxnoofTAIinAoI,

maxnoofTargetS-NSSAIs,

maxnoofTimePeriods,

maxnoofTNLAssociations,

maxnoofUEAppLayerMeas,

maxnoofUEsforPaging,

maxnoofUETypes,

maxnoofWLANName,

maxnoofXnExtTLAs,

maxnoofXnGTP-TLAs,

maxnoofXnTLAs,

maxnoofThresholdsForExcessPacketDelay,

maxnoofCandidateRelayUEs,

maxnoofSuccessfulPSCellChangeReports,

maxnoofCellsTSS,

maxnoofPeriodicities,

maxnoofPartiallyAllowedS-NSSAIs,

maxnoofRSPPQoSFlows

-- Q

QMCConfigInfo ::= SEQUENCE {

uEAppLayerMeasInfoList UEAppLayerMeasInfoList,

iE-Extensions ProtocolExtensionContainer { { QMCConfigInfo-ExtIEs} } OPTIONAL,

...

}

QMCConfigInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QMCDeactivation ::= SEQUENCE {

qoEReferenceList QoEReferenceList,

iE-Extensions ProtocolExtensionContainer { { QMCDeactivation-ExtIEs} } OPTIONAL,

...

}

QMCDeactivation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QoEReferenceList ::= SEQUENCE (SIZE(1..maxnoofUEAppLayerMeas)) OF QoEReference

QoEReference ::= OCTET STRING (SIZE(6))

QoERVQoEReportingPaths ::= SEQUENCE {

qoEReportingPath ENUMERATED{srb4, srb5, ...} OPTIONAL,

rVQoEReportingPath ENUMERATED{srb4, srb5, ...} OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QoERVQoEReportingPaths-ExtIEs} } OPTIONAL,

...

}

QoERVQoEReportingPaths-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosCharacteristics ::= CHOICE {

nonDynamic5QI NonDynamic5QIDescriptor,

dynamic5QI Dynamic5QIDescriptor,

choice-Extensions ProtocolIE-SingleContainer { {QosCharacteristics-ExtIEs} }

}

QosCharacteristics-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

QosFlowAcceptedList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAcceptedItem

QosFlowAcceptedItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

iE-Extensions ProtocolExtensionContainer { {QosFlowAcceptedItem-ExtIEs} } OPTIONAL,

...

}

QosFlowAcceptedItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-CurrentQoSParaSetIndex CRITICALITY ignore EXTENSION AlternativeQoSParaSetIndex PRESENCE optional },

...

}

QosFlowAdditionalInfoListRelCom ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAdditionalInfoItemRelCom

QosFlowAdditionalInfoItemRelCom ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

downlinkTLContainer TLContainer OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowAdditionalInfoItemRelCom-ExtIEs} } OPTIONAL,

...

}

QosFlowAdditionalInfoItemRelCom-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowAdditionalInfoListRelRes ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAdditionalInfoItemRelRes

QosFlowAdditionalInfoItemRelRes ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

uplinkTLContainer TLContainer OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowAdditionalInfoItemRelRes-ExtIEs} } OPTIONAL,

...

}

QosFlowAdditionalInfoItemRelRes-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowAddOrModifyRequestList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAddOrModifyRequestItem

QosFlowAddOrModifyRequestItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

qosFlowLevelQosParameters QosFlowLevelQosParameters OPTIONAL,

e-RAB-ID E-RAB-ID OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowAddOrModifyRequestItem-ExtIEs} } OPTIONAL,

...

}

QosFlowAddOrModifyRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ID id-TSCTrafficCharacteristics CRITICALITY ignore EXTENSION TSCTrafficCharacteristics PRESENCE optional }|

{ID id-RedundantQosFlowIndicator CRITICALITY ignore EXTENSION RedundantQosFlowIndicator PRESENCE optional }|

{ID id-UL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ID id-DownlinkTLContainer CRITICALITY ignore EXTENSION TLContainer PRESENCE optional }|

{ID id-ECNMarkingorCongestionInformationReportingRequest CRITICALITY ignore EXTENSION ECNMarkingorCongestionInformationReportingRequest PRESENCE optional },

...

}

QosFlowAddOrModifyResponseList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAddOrModifyResponseItem

QosFlowAddOrModifyResponseItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

iE-Extensions ProtocolExtensionContainer { {QosFlowAddOrModifyResponseItem-ExtIEs} } OPTIONAL,

...

}

QosFlowAddOrModifyResponseItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-CurrentQoSParaSetIndex CRITICALITY ignore EXTENSION AlternativeQoSParaSetIndex PRESENCE optional }|

{ ID id-TSCTrafficCharacteristicsFeedback CRITICALITY ignore EXTENSION TSCTrafficCharacteristicsFeedback PRESENCE optional }|

{ ID id-UplinkTLContainer CRITICALITY ignore EXTENSION TLContainer PRESENCE optional }|

{ ID id-DL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ ID id-ANPacketDelayBudgetUL CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget PRESENCE optional },

...

}

QosFlowFeedbackList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowFeedbackItem

QosFlowFeedbackItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

updateFeedback UpdateFeedback OPTIONAL,

cNpacketDelayBudgetDL ExtendedPacketDelayBudget OPTIONAL,

cNpacketDelayBudgetUL ExtendedPacketDelayBudget OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowFeedbackItem-ExtIEs} } OPTIONAL,

...

}

QosFlowFeedbackItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowIdentifier ::= INTEGER (0..63, ...)

QosFlowInformationList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowInformationItem

QosFlowInformationItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

dLForwarding DLForwarding OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowInformationItem-ExtIEs} } OPTIONAL,

...

}

QosFlowInformationItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ID id-ULForwarding CRITICALITY ignore EXTENSION ULForwarding PRESENCE optional}|

{ID id-SourceTNLAddrInfo CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional}|

{ID id-SourceNodeTNLAddrInfo CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional},

...

}

QosFlowLevelQosParameters ::= SEQUENCE {

qosCharacteristics QosCharacteristics,

allocationAndRetentionPriority AllocationAndRetentionPriority,

gBR-QosInformation GBR-QosInformation OPTIONAL,

reflectiveQosAttribute ReflectiveQosAttribute OPTIONAL,

additionalQosFlowInformation AdditionalQosFlowInformation OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowLevelQosParameters-ExtIEs} } OPTIONAL,

...

}

QosFlowLevelQosParameters-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ID id-QosMonitoringRequest CRITICALITY ignore EXTENSION QosMonitoringRequest PRESENCE optional}|

{ID id-QosMonitoringReportingFrequency CRITICALITY ignore EXTENSION QosMonitoringReportingFrequency PRESENCE optional}|

{ID id-PDUsetQoSParameters CRITICALITY ignore EXTENSION PDUsetQoSParameters PRESENCE optional}|

{ID id-ULBitRateControl CRITICALITY ignore EXTENSION ULBitRateControl PRESENCE optional},

...

}

QosMonitoringRequest ::= ENUMERATED {ul, dl, both, ..., stop}

QosMonitoringReportingFrequency ::= INTEGER (1..1800, ...)

QoSFlowList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowIdentifier

QosFlowListWithCause ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowWithCauseItem

QosFlowWithCauseItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

cause Cause,

iE-Extensions ProtocolExtensionContainer { {QosFlowWithCauseItem-ExtIEs} } OPTIONAL,

...

}

QosFlowWithCauseItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowModifyConfirmList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowModifyConfirmItem

QosFlowModifyConfirmItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

iE-Extensions ProtocolExtensionContainer { {QosFlowModifyConfirmItem-ExtIEs} } OPTIONAL,

...

}

QosFlowModifyConfirmItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowNotifyList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowNotifyItem

QosFlowNotifyItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

notificationCause NotificationCause,

iE-Extensions ProtocolExtensionContainer { {QosFlowNotifyItem-ExtIEs} } OPTIONAL,

...

}

QosFlowNotifyItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-CurrentQoSParaSetIndex CRITICALITY ignore EXTENSION AlternativeQoSParaSetNotifyIndex PRESENCE optional }|

{ ID id-TSCTrafficCharacteristicsFeedback CRITICALITY ignore EXTENSION TSCTrafficCharacteristicsFeedback PRESENCE optional },

...

}

QosFlowParametersList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowParametersItem

QosFlowParametersItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

alternativeQoSParaSetList AlternativeQoSParaSetList OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowParametersItem-ExtIEs} } OPTIONAL,

...

}

QosFlowParametersItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-CNPacketDelayBudgetDL CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget PRESENCE optional }|

{ ID id-CNPacketDelayBudgetUL CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget PRESENCE optional }|

{ ID id-BurstArrivalTimeDownlink CRITICALITY ignore EXTENSION BurstArrivalTime PRESENCE optional },

...

}

QosFlowPerTNLInformation ::= SEQUENCE {

uPTransportLayerInformation UPTransportLayerInformation,

associatedQosFlowList AssociatedQosFlowList,

iE-Extensions ProtocolExtensionContainer { { QosFlowPerTNLInformation-ExtIEs} } OPTIONAL,

...

}

QosFlowPerTNLInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowPerTNLInformationList ::= SEQUENCE (SIZE(1..maxnoofMultiConnectivityMinusOne)) OF QosFlowPerTNLInformationItem

QosFlowPerTNLInformationItem ::= SEQUENCE {

qosFlowPerTNLInformation QosFlowPerTNLInformation,

iE-Extensions ProtocolExtensionContainer { { QosFlowPerTNLInformationItem-ExtIEs} } OPTIONAL,

...

}

QosFlowPerTNLInformationItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QosFlowSetupRequestList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowSetupRequestItem

QosFlowSetupRequestItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

qosFlowLevelQosParameters QosFlowLevelQosParameters,

e-RAB-ID E-RAB-ID OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowSetupRequestItem-ExtIEs} } OPTIONAL,

...

}

QosFlowSetupRequestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ID id-TSCTrafficCharacteristics CRITICALITY ignore EXTENSION TSCTrafficCharacteristics PRESENCE optional }|

{ID id-RedundantQosFlowIndicator CRITICALITY ignore EXTENSION RedundantQosFlowIndicator PRESENCE optional }|

{ID id-ECNMarkingorCongestionInformationReportingRequest CRITICALITY ignore EXTENSION ECNMarkingorCongestionInformationReportingRequest PRESENCE optional },

...

}

QosFlowListWithDataForwarding ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowItemWithDataForwarding

QosFlowItemWithDataForwarding ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

dataForwardingAccepted DataForwardingAccepted OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QosFlowItemWithDataForwarding-ExtIEs} } OPTIONAL,

...

}

QosFlowItemWithDataForwarding-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-CurrentQoSParaSetIndex CRITICALITY ignore EXTENSION AlternativeQoSParaSetIndex PRESENCE optional },

...

}

QosFlowToBeForwardedList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowToBeForwardedItem

QosFlowToBeForwardedItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

iE-Extensions ProtocolExtensionContainer { {QosFlowToBeForwardedItem-ExtIEs} } OPTIONAL,

...

}

QosFlowToBeForwardedItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QoSFlowTSCList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QoSFlowTSCItem

QoSFlowTSCItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

tSCTrafficCharacteristicsFeedback TSCTrafficCharacteristicsFeedback OPTIONAL,

aNPacketDelayBudgetUL ExtendedPacketDelayBudget OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QoSFlowTSCItem-ExtIEs} } OPTIONAL,

...

}

QoSFlowTSCItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

QoSFlowsUsageReportList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QoSFlowsUsageReport-Item

QoSFlowsUsageReport-Item ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

rATType ENUMERATED {nr, eutra, ..., nr-unlicensed, e-utra-unlicensed},

qoSFlowsTimedReportList VolumeTimedReportList,

iE-Extensions ProtocolExtensionContainer { {QoSFlowsUsageReport-Item-ExtIEs} } OPTIONAL,

...

}

QoSFlowsUsageReport-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

**--------------------------------------------------------------------Unchanged part skipped-----------------------------------------------------**

-- U

UEAggregateMaximumBitRate ::= SEQUENCE {

uEAggregateMaximumBitRateDL BitRate,

uEAggregateMaximumBitRateUL BitRate,

iE-Extensions ProtocolExtensionContainer { {UEAggregateMaximumBitRate-ExtIEs} } OPTIONAL,

...

}

UEAggregateMaximumBitRate-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UEAppLayerMeasInfoList ::= SEQUENCE (SIZE(1..maxnoofUEAppLayerMeas)) OF UEAppLayerMeasInfoItem

UEAppLayerMeasInfoItem ::= SEQUENCE {

uEAppLayerMeasConfigInfo UEAppLayerMeasConfigInfo,

iE-Extensions ProtocolExtensionContainer { { UEAppLayerMeasInfoItem-ExtIEs} } OPTIONAL,

...

}

UEAppLayerMeasInfoItem-ExtIEs NGAP-PROTOCOL-EXTENSION::= {

...

}

UEAppLayerMeasConfigInfo ::= SEQUENCE {

qoEReference QoEReference,

serviceType ServiceType,

areaScopeOfQMC AreaScopeOfQMC OPTIONAL,

measCollEntityIPAddress TransportLayerAddress,

qoEMeasurementStatus ENUMERATED {ongoing,...} OPTIONAL,

containerForAppLayerMeasConfig OCTET STRING (SIZE(1..8000)) OPTIONAL,

measConfigAppLayerID INTEGER (0..15, ...) OPTIONAL,

sliceSupportListQMC SliceSupportListQMC OPTIONAL,

mDT-AlignmentInfo MDT-AlignmentInfo OPTIONAL,

availableRANVisibleQoEMetrics AvailableRANVisibleQoEMetrics OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { UEAppLayerMeasConfigInfo-ExtIEs} } OPTIONAL,

...

}

UEAppLayerMeasConfigInfo-ExtIEs NGAP-PROTOCOL-EXTENSION::= {

{ ID id-AssistanceInformationQoE-Meas CRITICALITY ignore EXTENSION AssistanceInformationQoE-Meas PRESENCE optional }|

{ ID id-MBSCommServiceType CRITICALITY ignore EXTENSION MBSCommServiceType PRESENCE optional }|

{ ID id-QoERVQoEReportingPaths CRITICALITY ignore EXTENSION QoERVQoEReportingPaths PRESENCE optional },

...

}

UE-associatedLogicalNG-connectionList ::= SEQUENCE (SIZE(1..maxnoofNGConnectionsToReset)) OF UE-associatedLogicalNG-connectionItem

UE-associatedLogicalNG-connectionItem ::= SEQUENCE {

aMF-UE-NGAP-ID AMF-UE-NGAP-ID OPTIONAL,

rAN-UE-NGAP-ID RAN-UE-NGAP-ID OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {UE-associatedLogicalNG-connectionItem-ExtIEs} } OPTIONAL,

...

}

UE-associatedLogicalNG-connectionItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UECapabilityInfoRequest ::= ENUMERATED {

requested,

...

}

UEContextRequest ::= ENUMERATED {requested, ...}

UEContextResumeRequestTransfer ::= SEQUENCE {

qosFlowFailedToResumeList QosFlowListWithCause OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {UEContextResumeRequestTransfer-ExtIEs} } OPTIONAL,

...

}

UEContextResumeRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UEContextResumeResponseTransfer ::= SEQUENCE {

qosFlowFailedToResumeList QosFlowListWithCause OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {UEContextResumeResponseTransfer-ExtIEs} } OPTIONAL,

...

}

UEContextResumeResponseTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UEContextSuspendRequestTransfer ::= SEQUENCE {

suspendIndicator SuspendIndicator OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {UEContextSuspendRequestTransfer-ExtIEs} } OPTIONAL,

...

}

UEContextSuspendRequestTransfer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UE-DifferentiationInfo ::= SEQUENCE {

periodicCommunicationIndicator ENUMERATED {periodically, ondemand, ... } OPTIONAL,

periodicTime INTEGER (1..3600, ...) OPTIONAL,

scheduledCommunicationTime ScheduledCommunicationTime OPTIONAL,

stationaryIndication ENUMERATED {stationary, mobile, ...} OPTIONAL,

trafficProfile ENUMERATED {single-packet, dual-packets, multiple-packets, ...} OPTIONAL,

batteryIndication ENUMERATED {battery-powered, battery-powered-not-rechargeable-or-replaceable, not-battery-powered, ...} OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { UE-DifferentiationInfo-ExtIEs} } OPTIONAL,

...

}

UE-DifferentiationInfo-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UEHistoryInformation ::= SEQUENCE (SIZE(1..maxnoofCellsinUEHistoryInfo)) OF LastVisitedCellItem

UEHistoryInformationFromTheUE ::= CHOICE {

nR NRMobilityHistoryReport,

choice-Extensions ProtocolIE-SingleContainer { {UEHistoryInformationFromTheUE-ExtIEs} }

}

UEHistoryInformationFromTheUE-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

UEIdentityIndexValue ::= CHOICE {

indexLength10 BIT STRING (SIZE(10)),

choice-Extensions ProtocolIE-SingleContainer { {UEIdentityIndexValue-ExtIEs} }

}

UEIdentityIndexValue-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

UE-NGAP-IDs ::= CHOICE {

uE-NGAP-ID-pair UE-NGAP-ID-pair,

aMF-UE-NGAP-ID AMF-UE-NGAP-ID,

choice-Extensions ProtocolIE-SingleContainer { {UE-NGAP-IDs-ExtIEs} }

}

UE-NGAP-IDs-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

UE-NGAP-ID-pair ::= SEQUENCE{

aMF-UE-NGAP-ID AMF-UE-NGAP-ID,

rAN-UE-NGAP-ID RAN-UE-NGAP-ID,

iE-Extensions ProtocolExtensionContainer { {UE-NGAP-ID-pair-ExtIEs} } OPTIONAL,

...

}

UE-NGAP-ID-pair-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UEPagingIdentity ::= CHOICE {

fiveG-S-TMSI FiveG-S-TMSI,

choice-Extensions ProtocolIE-SingleContainer { {UEPagingIdentity-ExtIEs} }

}

UEPagingIdentity-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

UEPresence ::= ENUMERATED {in, out, unknown, ...}

UEPresenceInAreaOfInterestList ::= SEQUENCE (SIZE(1..maxnoofAoI)) OF UEPresenceInAreaOfInterestItem

UEPresenceInAreaOfInterestItem ::= SEQUENCE {

locationReportingReferenceID LocationReportingReferenceID,

uEPresence UEPresence,

iE-Extensions ProtocolExtensionContainer { {UEPresenceInAreaOfInterestItem-ExtIEs} } OPTIONAL,

...

}

UEPresenceInAreaOfInterestItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UERadioCapability ::= OCTET STRING

UERadioCapabilityForPaging ::= SEQUENCE {

uERadioCapabilityForPagingOfNR UERadioCapabilityForPagingOfNR OPTIONAL,

uERadioCapabilityForPagingOfEUTRA UERadioCapabilityForPagingOfEUTRA OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {UERadioCapabilityForPaging-ExtIEs} } OPTIONAL,

...

}

UERadioCapabilityForPaging-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-UERadioCapabilityForPagingOfNB-IoT CRITICALITY ignore EXTENSION UERadioCapabilityForPagingOfNB-IoT PRESENCE optional },

...

}

UERadioCapabilityForPagingOfNB-IoT ::= OCTET STRING

UERadioCapabilityForPagingOfNR ::= OCTET STRING

UERadioCapabilityForPagingOfEUTRA ::= OCTET STRING

UERadioCapabilityID ::= OCTET STRING

UERetentionInformation ::= ENUMERATED {

ues-retained,

...

}

UERLFReportContainer ::= CHOICE {

nR NRUERLFReportContainer,

lTE LTEUERLFReportContainer,

choice-Extensions ProtocolIE-SingleContainer { {UERLFReportContainer-ExtIEs} }

}

UERLFReportContainer-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

UESecurityCapabilities ::= SEQUENCE {

nRencryptionAlgorithms NRencryptionAlgorithms,

nRintegrityProtectionAlgorithms NRintegrityProtectionAlgorithms,

eUTRAencryptionAlgorithms EUTRAencryptionAlgorithms,

eUTRAintegrityProtectionAlgorithms EUTRAintegrityProtectionAlgorithms,

iE-Extensions ProtocolExtensionContainer { {UESecurityCapabilities-ExtIEs} } OPTIONAL,

...

}

UESecurityCapabilities-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UESliceMaximumBitRateList ::= SEQUENCE (SIZE(1..maxnoofAllowedS-NSSAIs)) OF UESliceMaximumBitRateItem

UESliceMaximumBitRateItem ::= SEQUENCE {

s-NSSAI S-NSSAI,

uESliceMaximumBitRateDL BitRate,

uESliceMaximumBitRateUL BitRate,

iE-Extensions ProtocolExtensionContainer { { UESliceMaximumBitRateItem-ExtIEs} } OPTIONAL,

...

}

UESliceMaximumBitRateItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UE-UP-CIoT-Support ::= ENUMERATED {supported, ...}

ULBitRateControl ::= ENUMERATED {subject to, ...}

UL-CP-SecurityInformation ::= SEQUENCE {

ul-NAS-MAC UL-NAS-MAC,

ul-NAS-Count UL-NAS-Count,

iE-Extensions ProtocolExtensionContainer { { UL-CP-SecurityInformation-ExtIEs} } OPTIONAL,

...

}

UL-CP-SecurityInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

UL-NAS-MAC ::= BIT STRING (SIZE (16))

UL-NAS-Count ::= BIT STRING (SIZE (5))

UL-NGU-UP-TNLModifyList ::= SEQUENCE (SIZE(1..maxnoofMultiConnectivity)) OF UL-NGU-UP-TNLModifyItem

UL-NGU-UP-TNLModifyItem ::= SEQUENCE {

uL-NGU-UP-TNLInformation UPTransportLayerInformation,

dL-NGU-UP-TNLInformation UPTransportLayerInformation,

iE-Extensions ProtocolExtensionContainer { {UL-NGU-UP-TNLModifyItem-ExtIEs} } OPTIONAL,

...

}

UL-NGU-UP-TNLModifyItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

{ ID id-RedundantUL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ ID id-RedundantDL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional },

...

}

### 9.4.7 Constant Definitions

id-ULBitRateControl ProtocolIE-ID ::= xxx